

REMARKS

Claims 9, 10, 14, and 19-23 have been canceled, and new claim 24 has been added.

Thus, claims 1, 11-13, 15-18 and 24 are pending. Independent claim 1 has been amended to distinguish over the prior art of record. No new matter was added. Accordingly, Applicant respectfully submits that the present application is in condition for allowance.

Claim Rejection - 35 USC §102(b)

In the FINAL Office Action, claims 1 and 9-23 are rejected under 35 USC §102(b) as being anticipated by U.S. Patent No. 1,567,404 issued to Whitelaw et al.

Claim 1 of the present application has been amended to distinguish over the Whitelaw et al. patent. As amended, claim 1 includes the limitations previously stated in claims 9 and 14. In addition, claim 1 has been amended according to subject matter disclosed by FIG. 4 and on page 7, lines 15-27, of the present application, as filed. New independent claim 24 includes some of the same limitations recited in independent claim 1, as amended.

With respect to the steam generation unit, independent claims 1 and 24 of the present application require a combustion unit to be located within one side of the steam generation unit for the purpose of creating a pressure difference in the steam generation unit based on thermal gradient. It should be noted, that the present application defines the “steam generation unit” as the “case” (see page 4, lines 27-29, of the present application, as filed) that contains the liquid and in which the combustion unit and heat exchange unit extend. In addition, the claims of the present application require the length of the steam generation unit to be less than the length of the radiation panel body.

With respect to the steam introduction pipes and headers which provide a passage for steam from the generation unit to the radiation panel body and an opposed passage for liquid return from the radiation panel body to the steam generation unit, one of the steam introduction headers is required to open into a lower end of the radiation panel body and the other one is required to open only into the upper end of the radiation panel body. (For example, see the pipes/headers arrangement illustrated in FIG. 4 of the present application, as filed.) In addition, the steam introduction header that opens only into the upper end of the radiation panel body is required to extend from a side of the steam generation unit in which the combustion unit is located. (For example, see FIG. 4 and page 7, lines 17-19, of the present application, as filed.)

As stated on page 7, lines 25-27, of the present application, as filed, the above arrangement increases the efficiency of introducing steam from the generation unit into the radiation panel body and liquid return from the panel body to the steam generation unit thereby accelerating the introduction of steam into and uniformly throughout the radiation panel body. The heated vapor flows from the upper end of the radiation panel body (where it is released by the side header) to the lower end in the opposite side of the radiation panel body such that it must flow across the entire length of the radiator panel body. The vapor releases heat during this time and condenses returning to liquid form. All liquid is returned to the steam generation unit via the pipe/header that opens into the lower end of radiation panel body. Thus, the liquid is returned to the side of the steam generation unit opposite to the location of the combustion unit. All returning liquid flows past and is directly exposed, heated and vaporized by the heat exchange unit and combustion unit thereby greatly increasing conversion efficiency of evaporation/liquid return.

Turning to the above recited rejection based on the prior art Whitelaw et al. patent, a claim of a U.S. patent application is anticipated under 35 USC §102 only if each and every element is found described in a single prior art reference. **The identical invention must be shown in as complete detail as contained in the claim.** The elements identified by the reference must be arranged as required by the claim. If a prior art reference relied on in a rejection made under 35 USC §102 does not contain every element recited in a claim, as amended, in as complete detail as is contained in the claim and arranged as recited in the claim, the rejection has been overcome and should be removed.

Applicant respectfully submits that Whitelaw et al. fail to anticipate independent claims 1 and 24 of the present application. The “identical invention” of independent claims 1 and 24 of the present application is not disclosed by the Whitelaw et al. patent.

More specifically, Whitelaw et al. fail to disclose: (i) an oblong steam generation unit having a length shorter than a length of the oblong radiation panel body; (ii) a combustion unit located within one side of the steam generation unit for the purpose of creating a pressure difference in the steam generation unit based on a thermal gradient; (iii) a steam introduction header opening into a lower end of one side of the radiation panel body and an opposite steam introduction header opening only into the upper end of the opposite side of the radiation panel body; and (iv) a steam introduction header that opens only into the upper end of the radiation panel body extending from a side of the steam generation unit in which the combustion unit is located.

Whitelaw et al discloses a plurality of substantially-identical, upstanding, hollow “boiler” sections “A” aligned laterally in a row with a plurality of substantially-identical, hollow “heat

radiating” sections “B”. For example, see FIG. 1 and page 1, lines 44-47, of the Whitelaw et al. patent. Each adjacent pair of hollow sections “A” and/or “B” communicate via hollow nipples “3” at the top of the sections “A” and/or “B” and via hollow nipples “4” at the bottom of the sections “A” and “B”. See FIG. 1 and page 1, line 52-67. The hollow nipples “3” and “4” define the only passages which communicate between the adjacent, vertically-elongate sections of the radiator. The liquid present in the radiator extends within all sections “A” and “B” via the set of nipples “4”.

According to the structure of Whitelaw et al, all flow of steam and/or liquid return occurring between the sets of nipples “3” and “4” is vertical within each respective hollow section. Steam flows up each hollow section “A” and “B” toward nipples “3”, and water condensing within a section flows down the hollow section. There is no one-way cyclic path for steam and return liquid flow. It is simply simultaneously up and down each and every hollow vertically elongate section “A” and “B”. Thus, condensed water flowing downwardly within a hollow section is confronted with steam flowing upward in the same section at the same time.

The “steam generation unit” of the present invention is the “case” (see page 4, line 27, of the present application, as filed) that contains the liquid adjacent the lower end of the radiator panel body. Claims 1 and 24 require this case to be of a length that is less than the length of the radiator body. In Whitelaw et al., the “steam generation unit” is formed by the bottom hollow parts of all the sections “A” and B” interconnected by hollow nipples “4” in which the liquid resides. For example, see FIG. 1 of the Whitelaw et al. patent and the showing of the liquid within each section. Thus, the “steam generation unit” of Whitelaw et al. must be interpreted as the hollow bottom section of all of the sections which extends the full length of the radiator body

of the Whitelaw et al. patent. For at least this reason, Applicant submits that Whitelaw et al. fails to anticipate independent claims 1 and 24 of the present application since the length of its steam generating body is equal to the length of its radiator body.

In addition, Whitelaw et al. clearly fail to disclose a steam header that opens only into the upper end of the radiator. Each section “A” and “B” of Whitelaw et al. communicates with adjacent sections “A” and/or “B” via sets of hollow nipples “3” and “4”. With respect to the set of lower hollow nipples “4” illustrated in FIG. 1 of Whitelaw et al., the level of liquid in the bottom of the sections “A” and “B” is below the top of the nipples “4” interconnecting the bottom of the sections “A” and “B”. Accordingly, air, gas and/or steam can readily flow through the hollow nipples “4” throughout all sections “A” and “B” of the radiator of the Whitelaw et al. patent. Thus, there is no header structure in Whitelaw et al. that communicates only at the upper end of the radiator body. All the “headers” or hollow vertically-disposed elongate sections of Whitelaw et al. communicate at the top and bottom of each section. Accordingly, for at least this additional reason, Applicant submits that Whitelaw et al. fails to anticipate independent claims 1 and 24 of the present application.

Further, in the radiator of Whitelaw et al., steam freely rises vertically up all upstanding sections “A” and “B” throughout the length of the boiler, and water condensing within any particular section simultaneously flows down each upstanding section counter to the flow of steam within the same section. Thus, there is no one-way flow pattern of steam/return liquid. In contrast, the present invention has a pair of opposed headers located at opposite extreme sides of the radiator body. All steam entering the radiator body rises in a side header to the upper end of the radiator body. From this point, the steam and all condensed liquid are required to flow

toward the lower end of the opposite side of the radiator body to an opposite side header which returns the liquid to the steam generation unit. Thus, the structure of the present invention creates a cyclic one-way flow pattern through which the steam/return liquid flows (in a clockwise direction as viewed in FIG. 4 of the present application, as filed). The structure of Whitelaw et al. fails to disclose such a one-way flow pattern. Accordingly, the evaporation/liquid return system of the present invention is clearly different from that disclosed by the Whitelaw et al. patent.

Of course, since Whitelaw et al. fails to disclose a pipe/header that opens only into the upper end of the radiator body, Whitelaw et al. also fails to disclose that the pipe/header that opens only into the upper end of the radiator body extends from a side of the steam generating unit in which the combustion unit is located. Note that the upright hollow sections "A" of Whitelaw et al. that extend above gas burner "14" all include openings defined by hollow nipples "4" at the lower end of the radiator body. Accordingly, for at least this additional reason, Applicant submits that Whitelaw et al. fails to anticipate independent claims 1 and 24 of the present application.

Still further, the gas burner "14" of Whitelaw et al. cannot uniformly heat the liquid contained in the bottom of the hollow sections "A" and "B". This is because the liquid contained in sections "B" of Whitelaw et al. are not directly exposed to the heat of the gas burner "14" which only extends under sections "A". In contrast, the present invention funnels all liquid back to and across the heat exchange unit and combustion unit to efficiently convert the return liquid to steam. Thus, according to the present invention, the liquid is returned via a side header opposite the combustion unit and flows in a direction across the heat exchange unit and

combustion unit, and the created steam flows into a side header extending from a side of the steam generation unit in which the combustion unit is located.

For the above reasons, Whitelaw et al. clearly fail to disclose an "identical invention" required for a proper anticipation rejection under 35 USC §102(b). Therefore, Applicant respectfully requests reconsideration and removal of the rejection of claims, as amended, of the present application.

Conclusion

In view of the above amendment and remarks, Applicant respectfully submits that the rejection stated in the Office Action has been overcome. A favorable action on the merits is therefore requested.

Please charge any deficiency or credit any overpayment for entering this Response to our deposit account no. 08-3040.

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